

ABSTRACT

[Abstract]

[Object] To realize a diffusion film in which arbitrary control of the diffuse light intensity distribution characteristics, and an angular range of diffusion does not change with respect to an incoming light from a specific angular range and a light-outgoing direction converting element that is high in efficiency of conversion of the outgoing direction, and has no limit in the angle of conversion of the outgoing direction, and to provide a thin-model high-quality projection display using the same as a screen.

[Solving Means] A projection display screen formed of a diffusion film having a structure in which a plurality of layers  $51_1$ ,  $51_2$  each having different refractive indexes from the adjacent layers and constituting a plurality of optical waveguides of a step index type form a stripe arranged in the banded state in the direction on a film plane and extend in the direction of the layer inclination angle distributed substantially in a top hat shape within a specific angular range with respect to the direction of the film thickness, a structure in which a plurality of layers  $52_1$  forming optical waveguides having a refractive index distribution that brings out a light-collecting property in the direction of the layer thickness extend in the direction of the film

thickness or in the direction inclined from this direction with a layer length distributed within a predetermined range substantially in the top hat shape in a portion in the direction of the film thickness, or a structure of combination thereof. Also, in a screen 10 including a diffusing film 3 and a light-outgoing direction converting film 2 for causing an incident light from an oblique direction to go out toward the front direction, the light-outgoing direction converting film has a structure in which a plurality of layers 1 each having a refractive index different from adjacent layers and forming optical waveguides of a step index type and/or of a type having a distribution of refractive indexes that brings out a light-collecting property in the direction of the layer thickness are arranged in a banded state in the direction of a film plane, and extend so as to be bent with respect to the direction of the film thickness.

[Selected Figure] Fig. 1